

NPIC/TSSG/DED-1546-69
25 March 1969

MEMORANDUM FOR: Executive Director, National Photographic Interpretation Center

SUBJECT: FLUIDICS

1. In response to your memorandum request of 24 February, the following information has been compiled:

a. "FLUIDICS - The use of devices that have no moving parts, and that use a fluid medium (usually low pressure gases), for control of other devices, or that directly achieve an object such as logic, computation or amplification." (Ref. - "Fluidics: Development and Outlook" by Alexander Block - Engineer Magazine, January - February, 1969).

b. Modern FLUIDICS dates from 1957, and, according to a Harvard Business School estimate made in 1965, will have a predicted U. S. market of \$460 - \$860 million by 1975.

c. FLUIDICS primary limitation is relatively low-speed operation compared to electronic devices. High reliability (about 5:1 over similar electronic devices) is its main asset. Hence, its major application is in industries where these factors can be traded off, e.g., machine tool and aerospace industries.

d. Simple FLUIDIC device -

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Control-pressure at control-port (a) provides pressure output at port (A). Removal of the control-pressure does not change the output - the main jet continues to cling to the wall (due to a long recognized physical phenomena known as the Coanda effect) and provide pressure at port (A). Upon applying a control-pressure to control-port (b), however, the output pressure switches to output port (B). Gain, defined as the ratio of output change to control change, is about 25 for such a device.

2. Due to the relative infancy of this field of control and its low-speed operation, it does not appear as if FLUIDICS would be a wise or economical substitute for the electronic controls presently used in our equipment.

Chief, Technical Services & Support Group
NPIC

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